

50 A YEAR

February 7, 1953

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SCIENCE NEWS LETTER

DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE

A SCIENCE SERVICE PUBLICATION

It
adds
miles
to your voice



New "500" telephone. It has already been introduced on a limited scale and will be put in use as opportunity permits, in places where it can serve best. Note new dial and 25 per cent lighter handset.

For years the telephone you know and use has done its job well—and still does. But as America grows, more people are settling in suburban areas. Telephone lines must be longer; more voice energy is needed to span the extra miles.

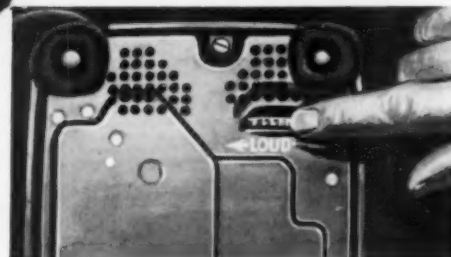
Bell Telephone Laboratories developed a new telephone which can deliver a voice ten times more powerfully. Outlying points may now be served without the installation of extra-heavy wires or special batteries on subscribers' premises. For shorter distances, the job can be done with thinner wires than before. Thus thousands of tons of copper and other strategic materials are being conserved.

The new telephone shows once again how Bell Telephone Laboratories keeps making telephony better while the cost stays low.

**BELL TELEPHONE
LABORATORIES**



Improving telephone service for America provides careers for creative men in scientific and technical fields.



Adjustable volume control on bottom of new telephone permits subscriber to set it to ring as loudly or softly as he pleases. Ring is pleasant and harmonious, yet stands out clearer.

QUICK FACTS ON NEW TELEPHONE

Transmitter is much more powerful, due largely to increased sound pressure at the diaphragm and more efficient use of the carbon granules that turn sound waves into electrical impulses.

Light ring armature diaphragm receiver produces three times as much acoustic energy for the same input power. It transmits more of the high frequencies.

Improved dial mechanism can send pulses over greater distances to operate switches in dial exchange.

Built-in varistors equalize current, so voices don't get too loud close to telephone exchange.

Despite increased sensitivity of receiver, "clicks" are subdued by copper oxide varistor which chops off peaks of current surges.

MEDICINE

Hint Polio Vaccine Ready

Vaccine is apparently available for mass testing of perhaps as many as 25,000 small children against infantile paralysis during the coming year.

► BY THE end of next year hundreds, maybe even as many as 25,000, small children and their anxious parents and doctors will know that they have long-time protection against all three infantile paralysis viruses—if plans strongly hinted at are carried out.

A vaccine to do the job apparently is ready. This much seems clear from statements of Dr. Harry M. Weaver, director of research of the National Foundation for Infantile Paralysis, at a meeting of the Foundation board of trustees in New York.

If the Foundation decides the time has come to make field trials, the vaccinating will either be started within the next few months or not until fall. The reason for vaccinating either now or not until fall is to do the job before or after the big summer polio season when chance exposure to the virus would confuse the results.

That the vaccinating may be done this spring is suggested by Dr. Weaver's statement that the kind of progress made within the past several months is the kind "one is accustomed to see prior to the taking of an important forward step."

Dr. Weaver said he could not "with complete assurance" announce that field tests with a vaccine would be undertaken in 1953.

If the pattern of the Foundation-supported field trials of blood's gamma globulin is followed, some hundreds or maybe even as many as 50,000 children will get "shots." Half of them will get vaccine "shots." The other half will get a harmless substance that looks enough like the vaccine to fool everyone except a few persons in the know.

Starting six weeks after the vaccinations and continuing once a month for six months, blood from all the children probably will be taken for testing. The level of polio-fighting antibodies in the blood would be compared with that in the children's blood before the vaccinating and with that of the controls who got "shots" of vaccine substitute.

Depending partly on the results of this sort of trial, children in 1954 might all get anti-polio vaccination.

Dr. Weaver did not give any details of how the field trials would be conducted or where. They might be made on children in institutions who could be kept from contact with the polio virus during the summer epidemic season. Or the vaccinating might be done in the fall with idea of raising the antibody level to the desired point before the 1954 polio season.

The vaccine to be used would be made

from polio virus treated with certain chemicals, such as formalin, to make it incapable of damaging nerve cells but still able to call up antibodies. It would probably be given with certain oils to potentiate it and thus overcome the disadvantages of chemical treatment.

Successful vaccination of six children with a chemically treated virus was reported last fall by Dr. Howard A. Howe of Johns Hopkins University. The vaccine Dr. Howe used was made from viruses taken from brain and nervous tissue. (See SNL, Nov. 1, 1952, p. 282.)

Now, however, it is possible to grow polio viruses outside the body on non-nervous tissue. Specifically, they can be grown on monkey testicular tissue in the test tube. The viruses grown this way are considered safer to use than nervous tissue virus. Also virus grown this way can be produced in larger quantities, such as would be needed if the virus can be made into a safe and effective vaccine.

Important unanswered question about polio vaccine, however made, is how long it will protect against the disease.

For the coming polio season, best hope for protection may yet depend on blood's gamma globulin, shown in field trials last summer to be effective. But this material is in very short supply. There is not nearly enough for all American children. Who will get it this coming season has yet to be determined.

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METEOROLOGY

Track Jet Streams By Cloud Formations

► JET STREAMS, the 200 to 300 mile-an-hour wind currents high in the atmosphere that affect our weather, can be tracked by observation of cloud formations from the ground, according to Dr. Vincent J. Schaefer of General Electric Company.

In a report to the annual meeting of the American Meteorological Society in New York, he said that four "specific and rather spectacular cloud types" are visual keys to the whereabouts of this high-speed stream.

The fast-moving wind currents have been known to double the speed of high-flying planes, but since there are no charts to show their position, finding the jet streams is a hit-or-miss proposition.

The four basic cloud formations indicating jet streams as listed by Dr. Schaefer are: Cirrus streamers, white feathery wisps with tufted trails, seen moving at high speeds and high altitudes.

High cirrocumulus—small, white, rounded clouds in patches often scattered at ran-



BILLOWING ALTOCUMULUS—One of the four types of cloud formations that give strong evidence that jet streams are racing by high overhead. Main axis of these swift wind streams might be charted from such cloud clues.

dom, but sometimes shifting rapidly to cirrus streamers with delicate wave patterns.

Alto cumulus, fleecy, nearly stationary formations with lens-shaped clouds, piled layer upon layer at middle altitudes.

Billowing alto cumulus clouds which often extend from horizon to horizon, with parallel waves running at right angles to the direction of air flow.

Other tell-tale signs of the proximity of the major axis of the storm, Dr. Schaefer said, include gustiness at ground level in about half the cases observed; persistent cool, crisp air; generally blue skies, with visibility unlimited; precipitation often limited to sporadic sprinkles of rain or snow, and rapid changes in cloud cover, from one-tenth of the sky to nine-tenths and back again in less than an hour.

Quick identification of jet streams would be helpful both to pilots and to weather forecasters. The speedy wind currents, often 100 miles wide, circle the world in a meandering fashion, although the flow is generally from west-to-east. Their existence has been known only a few years.

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METEOROLOGY

Hurricane "Eye" Curves

► A HURRICANE'S EYE—the calm center around which winds whirl—goes up to the top of the storm, curves around and then comes down to earth again some 200 to 300 miles away, the American Meteorological Society meeting in New York was told.

On its way down to earth, however, this second column of calm air can no longer be properly called an eye. It is, in the language of the hurricane watchers, a "hyperbolic point." Tracking of the hyperbolic point, Dr. Leon Sherman of Florida State University said, may permit forecasting more accurately the path a raging hurricane will take.

The hyperbolic point almost always keeps its position in relation to the eye of the hurricane and the direction in which the hurricane is moving, Dr. Sherman said. Thus if it begins to swing around the eye, this fact is a good indication that the hurricane is going to change its path.

Hurricane forecasters many times have a difficult job determining whether an Atlantic storm is going to come in over the coast to do its damage, or whether it will swing to a northeasterly path to spend itself harmlessly over the ocean. The movement of the hyperbolic point, Dr. Sherman declared, can help in determining in which way the hurricane will go.

The hyperbolic point, Dr. Sherman said, is removed from the terrific winds around the eye of the hurricane and thus is much easier to observe. Winds around its dead calm center are usually no more than 15 or 20 miles an hour, presenting little danger to the Navy and Air Force pilots of the planes used to trace hurricanes.

SURGERY

Aid Ankle Sprain Recovery

► A CHEMICAL extracted from the tissues of a bull is being used to speed recovery from painful ankle sprains, Dr. W. R. MacAusland, Jr., of the U. S. Air Force Hospital, Maxwell Air Force Base, Ala., reported at the meeting of the American Academy of Orthopaedic Surgeons in Chicago.

The chemical is an enzyme named hyaluronidase. Within two hours after it is injected into the injured ankle, swelling is reduced and pain relieved. The patient can walk, bearing his full weight, shortly after the drug is injected.

Patients with hemophilia, the hereditary bleeders' disease, are also being helped by this chemical, Dr. MacAusland reported. In this condition the joints often "balloon up" and become painful because of bleeding around the joint. The bleeding may be started by a slight blow or bump even when there is no break in the skin.

The hyaluronidase is injected, with a local anesthetic, into the joint after the blood has been removed with a needle. The joint is bandaged and the patient kept in bed for 24 hours during which time the pain disappears and movement of the joint is greatly improved. After 48 hours he is able to walk without pain.

Prevention of subsequent crippling arthritis is the chief advantage of this new treatment, in Dr. MacAusland's opinion.

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GENERAL SCIENCE

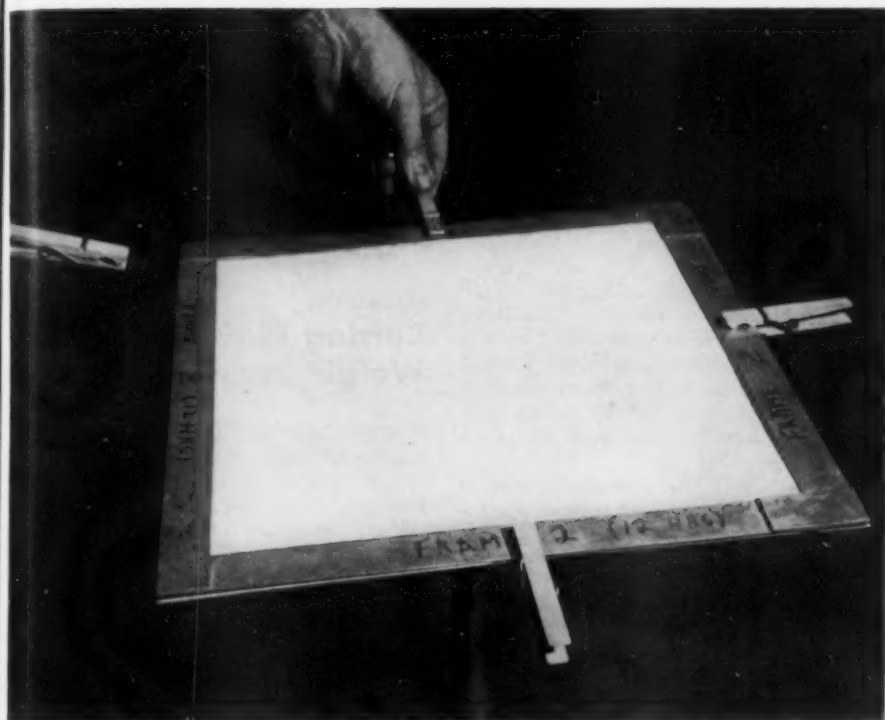
Heart Specialist Gets First of New Awards

► FIRST TO receive a newly established health award was Dr. Paul Dudley White, world famous heart specialist of Boston, Mass.

The award, consisting of \$1,000, a scroll and a gold statuette of the Winged Victory of Samothrace, has been established by the Albert and Mary Lasker Foundation and the American Heart Association "for distinguished achievement in the field of cardiovascular (heart and blood vessel) diseases—the leading cause of disability and death in the United States."

Dr. White's award was formally presented to him at the 1953 Heart Fund Dinner of the Massachusetts Heart Association in Boston, Feb. 2, by Dr. Irving S. Wright, president of the American Heart Association.

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ATOMIC DUST COLLECTOR—Gummed paper, one-foot square, placed on a three-foot high stand, collects dust in the air in one of the two sampling methods used at fixed stations monitoring for atomic debris. The sheets are changed every 24 hours.

PHYSICS

Atomic Explosion Evidence

Radiations from debris of the fission process can be picked up by detection instruments all over the world. Progress toward useful power from atom highlighted in AEC report.

See Front Cover

Former President Truman was quoted on Jan. 26 as saying that he was still "not convinced" that Russia has a workable atomic bomb. Congressional, atomic and civil defense officials immediately contradicted this statement, recalling the announcements of three Russian blasts made from the White House during Truman's administration. Following is an explanation of how an atomic explosion can be detected.

► **EVIDENCE FOR** an explosion of atomic bomb material in Russia would be read on instruments such as Geiger counters and scintillation counters all over the world.

Judgment as to whether such an explosion came from an intentional bomb explosion or from the accidental blow-up of an atomic pile would have to be made by comparison.

The evidence might appear as a general increase in radiation, which might be shown by fogging of photographic plates in normally protective wrappings. On monitoring instruments, a sudden increase in the

amount of "background" radiation detected would show that something had happened.

Differences as to time and intensity of such readings on the Pacific and Atlantic coasts, and in other parts of the country, would point to the place and time that the atomic explosion had occurred.

A more direct way of learning about such an explosion was actually discovered on Feb. 7, 1951, when radioactive snow fell in Ann Arbor, Mich., and other places in the United States following the test explosion of an atomic bomb by the Atomic Energy Commission in Nevada. This snow, and the fine dust carried aloft by other atomic bomb explosions, when collected and analyzed, was found to be carrying samples of fission products.

Such material can be carried in the upper atmosphere to great distances. When it finally settles to earth, it can tell directly what kinds of materials were involved in the original explosion.

The explosion of an atomic bomb sets free in the air the fission products of the uranium 235 or the plutonium 239 which

were the materials that exploded, together with fragments of whatever materials made up the casing of the bomb. These materials, even divided into the smallest particles, would give off radioactive rays which can be recognized by the rate at which their activity dies away.

Similar radioactive dust from the explosion of an atomic reactor might be expected to contain many more kinds of material than that from a bomb. Such a calamity has never, so far as the public knows, taken place on earth.

It is known, however, that an atomic pile is built up of graphite with boron and cadmium in the controls, beryllium in the neutron reflector, and concrete and lead for shielding. All these should modify the record of fission products.

The radiation monitoring system set up by the Atomic Energy Commission to keep a continuous check on radioactive dust in the atmosphere is described in the Commission's 13th semiannual report. A network of observing stations extends across the U.S., with a total of 121 fixed stations operated in connection with the U.S. Weather Bureau, and two mobile monitoring teams which cover varying locations in a zone from 200 to 500 miles from the test site near Las Vegas, Nev.

The amount of radioactivity found at the stations is recorded continuously, and this is related to the type of burst, the radioactive cloud formed by the experimental atomic explosions, and the weather conditions.

Shown on the cover of this week's SCIENCE NEWS LETTER are some dust samples being processed. The technician at left folds the samples and places them in crucibles for ashing in the furnace. At right, a technician grinds the ashes and places them in numbered planchets for measuring.

As a side result, valuable information is furnished to industries sensitive to increases in normal background radiation, and to meteorologists on movements of large masses of air at varying altitudes.

Progress Toward Useful Power

Work on harnessing the atom for useful power is progressing at a fast-moving pace, the AEC also reported.

Outlined in its 13th semiannual report was the present state of development of nuclear reactors. These include both research and testing reactors as well as power plants to propel airplanes, submarines and large surface vessels.

Work has started on the development of "a nuclear power plant suitable for the propulsion of large naval surface vessels such as aircraft carriers," the report said.

Use of the atom for industrial power, subject of reports of four industrial teams during the latter half of 1952, raises "unique policy" problems that require decision. These include, the AEC states, "ownership of the plants, licensing and use of fissionable materials, secrecy, patent rights, public safety, and liability in case of disaster."

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ELECTRONICS

Advances in Transistors

The tiny devices are now beginning to come out in full commercial production, bringing the day of wrist radios, portable TV sets and cheaper car radios ever closer.

► THOSE TINY bits of germanium called "transistors" are taking Paul Bunyan strides through the field of electronics. They are bringing ever nearer the day of wrist radios, portable TV sets and strange musical instruments.

Already the kernel-like devices have taken over the work of tubes in some radio and TV equipment. Hearing aids also are working now without the hum and ping of hot vacuum tubes.

To hard-of-hearing persons, transistors will mean lower hearing-aid operating costs because they need very little current to operate. This means longer-lasting batteries, and some hearing aids now have dispensed with the bulky "B" battery completely. The devices work more quietly than vacuum tubes and they reproduce loud noises without as much distortion.

Because of the relative newness of the transistors they have not as yet been made in quantities large enough to invade the vacuum tube's stronghold. But it seems likely that more and more companies will be announcing full commercial production of them just as the Raytheon Manufacturing Company has announced it now is shipping "tens of thousands" to hearing-aid makers.

The Walkie Lookie, a portable TV camera affectionately called the Creepie Peepie by its users, covered the recent political conventions with transistor innards. And a telephone switching arrangement in Englewood, N. J., uses six of the match-head-size gadgets to help Englewood residents dial San Francisco telephones directly.

Much fundamental research on semi-conductors and solid state physics was done by Dr. Karl Lark-Horovitz and his research group at Purdue University, Ind. Transistors were developed by the Bell Telephone Laboratories in a program of research aimed at improving telephone service. The little things are smaller, more rugged, require less power and do a better job than regular vacuum tubes.

Radio and electronic tube manufacturers are scrambling to find new transistor applications. Hush-hush military projects are going on behind closed doors. Long-lasting amplifiers slated for ocean bottoms are being improved with transistors. Buried with transoceanic cables, the amplifiers magnify messages sent from continent to continent so they will not fade en route. Because of their ruggedness, "transistorized" amplifiers should eliminate many an electronic headache under the restless sea.

Recently, the Radio Corporation of

America displayed various items to which they had hitched the transistor. The items included an electric ukulele with a built-in amplifier and speaker; a portable, battery-operated television receiver which was completely tubeless except for the picture tube, and a toy piano that had keys and transistors only—no strings.

The transistor's impact on the layman is not yet clear. But it could mean, for instance, that automobile radios will be much cheaper in the future. Transistors can operate directly from the car's six-volt battery, eliminating a relatively costly high-voltage power supply now required by vacuum tubes.

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ORNITHOLOGY

Hall of Pacific Birds Opens at Museum

► THE AMERICAN Museum of Natural History officially opened its new Hall of Pacific Bird Life on Jan. 29, culminating more than 20 years of expeditions, planning and research.

The new hall contains over 400 different kinds of Pacific birds, many of which have only been seen alive by a few explorers.



FRUIT DOVE—Part of the Philippines group in the new Whitney Memorial Hall is the white-eared fruit dove shown here.

Two of the 21 groups in the hall represent areas well known to G.I.'s of the South Pacific campaigns: Bataan in the Philippines, and Rouna Falls near Papua, New Guinea. Forty-seven species of birds are shown against the background of Corregidor, the famous Philippine fortress. Among the Rouna Falls exhibits, scene of another World War II battle, are ostrich-like cassowaries and, paradoxically, Birds of Paradise.

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AERONAUTICS

Cutting Plane Equipment Weight Pressing Problem

► ATOMIC-POWERED PLANES, intercontinental missiles and electronic robots are all being studied and developed by the U. S. Air Force, but one of the most pressing problems now facing aeronautical engineers is that of keeping down the weight of equipment that goes into fighter planes and bombers.

Gen. Hoyt S. Vandenberg, chief of staff of the Air Force, told the American Institute of Aeronautical Sciences meeting in New York that research interest should be concentrated along those lines rather than upon visions of "weird mechanical monsters swarming across the land, sea and sky at some unknown date."

We must continue to meet and defeat the sparsely equipped, lighter and more numerous aircraft of our enemies. But we are determined to do it without sacrificing the lives of our pilots in flimsy or incomplete planes and without abandoning our present superiority in auxiliary combat equipment," he said.

With the increasing complexity of modern air weapons, there is a danger of being stalled on the threshold of great achievements by some seeming trifle that research has overlooked, he warned. The success of an entire new weapons system may hang on the success of an innovation as minor as the liquid suspension for gyroscopes.

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VETERINARY MEDICINE

Civil War Disease Plagues Today's Cattle

► A DISEASE said to be partly responsible for the military failures of Union Army Gen. George McClellan during the war between the states has come back to plague cattlemen and dairy farmers during the past year.

The disease, which attacked McClellan's cavalry and artillery horses, is vesicular stomatitis. Symptoms in cattle are like those of foot and mouth disease. It may also be a public health threat because humans in contact with sick animals have caught it, warns Dr. S. H. McNutt of the University of Wisconsin in a report to the American Veterinary Medical Association in Chicago.

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UNLOADING RADIOACTIVE COBALT—Two University of Notre Dame scientists supervise the unloading of a vial of radioactive cobalt encased in a half-ton lead turret. At left, Robert Lazo directs the crane's movements while Dr. Harold Dewhurst measures the intensity of radiation with a meter. The cobalt will provide a source of 1,000,000 electron-volt gamma rays.

MEDICINE

Only Reducing Method

► **BATHS, EXERCISE**, massage and other non-dietary methods recommended for reducing weight cannot accomplish this purpose. The "only logical method" of reducing weight is to reduce properly the intake of food.

This opinion is given in the *Journal of the American Medical Association* (Jan. 24) by Dr. Frank H. Krusen of Rochester, Minn., chairman of the Association's council on physical medicine and rehabilitation.

"A rapid movement of the head from right to left when the mashed potatoes and gravy are passed" is the best exercise for reducing, in Dr. Krusen's opinion.

On hot baths, whether Turkish, Russian or some other variety, Dr. Krusen says it has been calculated that a person would have to take 370 such baths in which on each occasion the body temperature was raised two degrees Fahrenheit for one hour in order to lose one pound of fat.

"Massage," he says, "will not reduce local deposits of fat. Massage will not increase muscular strength."

Whether the massage is given by a person or by mechanical gadgets, "there is no scientific proof whatever" that it can be effective as a reducing measure.

Fat people overeat, Dr. Krusen says, "because they thoroughly enjoy fine food."

Such persons do not even realize that they are eating far more calories than they need. The appetite mechanism in the normal person functions to make him feel full and satisfied when he has eaten just enough food to fill his requirements for energy and to keep his reserves of fat at a constant normal level. Then he stops eating.

But the fat person who overeats enjoys good food so heartily that his level of satiation is almost unbelievably high.

"Even after an enormous meal he can still consume with gusto several after-dinner chocolate mints, coffee with cream and sugar and sweet liqueur, and he will still," Dr. Krusen points out, "be ready to munch some salted nuts while drinking a highball a little later in the evening."

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• RADIO

Saturday, Feb. 14, 1953, 3:15-3:30 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Harold Myers Marvin, member, Board of Directors, American Heart Association, and associate clinical professor of medicine, Yale University, discusses "Fighting for Your Heart."

CHEMISTRY

New "Cold Bomb" Test Measures Air Pollution

► A NEW test for measuring the smog-causing materials that pollute the air was described to the American Chemical Society's North Jersey section meeting in Newark.

Air pollution caused by the exhaust gases from autos and other incomplete combustion of hydrocarbons, such as from industrial plants, can be detected using a stainless steel "cold bomb," Ernest R. Quiran of the Esso Laboratories, Linden, N.J., reported.

With his co-workers, S. J. Metro and J. B. Lewis, Mr. Quiran made a synthetic smog to test the device, found that it would measure up to 95% of the noxious materials in mixtures containing only one-tenth of a percent of hydrocarbons.

Many scientists think that the Los Angeles smog is caused partly by the interaction of incompletely burned hydrocarbons with the ozone in the air.

In the new test, the gases are collected by adsorption on silica gel, a granulated material related to ordinary sand, which is kept at a temperature of 100 degrees below zero Fahrenheit. The collected gases are transferred to the cold bomb, a stainless steel container, where an electronic device, the mass spectrometer, then measures the amounts and kinds of gases in the bomb.

Sulfur compounds and carbon monoxide can also be detected by this method, the scientists state, but the amounts of these two chemicals can not be measured.

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BIO-ENGINEERING

Functional Anatomy Part of Engineering

► A CERTAIN amount of functional anatomy may be added to the traditional engineering core of mathematical and physical sciences.

"Today there is an increasing accent upon human biology in engineering research," Dr. Craig Taylor, University of California at Los Angeles professor of engineering, pointed out. "In order to design structures, machines and other technical devices so that man can 'assimilate' them, modern engineers are more and more finding a knowledge of this subject necessary."

An example of such research is the U.C.L.A. department of engineering is in the development of artificial arms. A fairly detailed knowledge of the function of the natural arm is obviously necessary.

Other such studies, said Dr. Taylor, include those of human heat tolerance and of neuromuscular control. The heat tolerance factor is important in the design of jet and rocket planes where heat of friction may seriously affect the pilot. Neuromuscular control is an important factor in the design of controls for high performance aircraft.

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BIOCHEMISTRY

Trypan Red Combats Concussion After-Effects

► **TRYPAN RED**, a dye now used to treat some epilepsy patients, may be a good agent to combat the after-effects of head concussion. This is reported by Drs. Robert B. Aird and David Zeale, and L. S. Strait and Michael Hrenoff of the University of California School of Medicine.

Their experiments have shown that the dye eliminates abnormal brain waves characteristic of the after-effects of concussion. Experiments also showed that it prevents disruption of the blood-brain barrier in concussion. The action of the agent in concussion apparently is similar to its action in epilepsy. The scientists had previously found that the dye offers some protection against epileptic seizures.

The blood-brain barrier is a mechanism which screens substances passing from the blood vessels into the brain. The blood vessel walls allow the right amounts of nourishment and other needed substances to go into the brain, and they normally prevent harmful materials from entering.

Infections, toxic conditions, and injuries to the brain as in concussion can disrupt the normal delicate chemical balance maintained by the blood-brain barrier. Trypan red and a sister drug used earlier, brilliant vital red, help restore the function of the protective barrier.

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ORNITHOLOGY

Fight Against Starlings Is Washington Problem

► **BRITAIN'S LATEST** request for U. S. technical aid reveals its profound faith in Yankee ingenuity; however, it looks as if we must give their faith a jolt.

Sixty-three years after 60 noisy starlings were imported from England to the U. S., municipal authorities in the mother country have sent out a plea to America for ways to control this feathered pest. But after 63 years of experience, we have not learned the answer.

An arch-foe of starlings in the U. S., William A. Xanten, head of the District of Columbia sanitation department, told SCIENCE SERVICE he has received letters from Westminster and Edinburgh asking for the secret of his success in mastering this bane of city dwellers.

But Mr. Xanten will be the first to admit he has found no secret, and very little success, where starlings are concerned.

An annual starling invasion of Washington begins in the fall and lasts till spring, during which time they occupy such strategic positions as the tree-tops above Pennsylvania avenue and the entrances to many government buildings, to carry on their warfare against non-feathered bipeds.

In the course of his defensive campaign, Mr. Xanten has employed balloons, screech

owls, itching powders, and stink bombs against the relentless foe, but never with more than temporary success.

He did manage to preserve the dignity of the Inaugural Day parade watchers along Pennsylvania avenue by spraying the roosts with a fire hose the day before. This rough treatment, plus the noise of the crowd scared them away for the big day, Mr. Xanten theorizes.

Other starling observers think the starlings left because of hurt pride, when humans made more noise than they for a change.

But time heals pride's wounds, and the starlings are back in full force.

Science News Letter, February 7, 1953

PHYSICS

Method Measures Viscosity of Fluids

► **EXPERIMENTS WITH** crystals of barium titanate may provide a new method of measuring fluid viscosity, and thus be of practical use to the petroleum, chemical, aviation and other industries.

The investigation is being conducted by Herman Medwin, University of California at Los Angeles physicist.

Barium titanate crystals expand as voltage is applied to them and contract when voltage is reversed. The pulsing of the crystals propagates the ultrasonic waves in a fluid-filled glass tube.

"Scientists have long been aware that intense sound produces movements of fluids somewhat similar to those of air in front of an electric fan," points out Mr. Medwin.

"The movement occurs because momentum lost by the sound wave is taken up by the medium and causes motion of it. Just how the transfer of momentum occurs is not known. This is one of the factors the research is attempting to clarify."

Present methods measure only shear viscosity and deal with the rate at which incompressible fluids flow through a tube. The new method would measure bulk viscosity by the movement of the fluid induced by sound waves.

Science News Letter, February 7, 1953

BIOCHEMISTRY

Radioactive Chemicals Help Blood Research

► **TWO NEW** radioactive chemicals, one of them adrenalin, are now commercially available for use in research on such ills as blood pressure and diabetes.

Made for the first time by chemists at Tracerlab, Boston, the two compounds can be traced in their course through the blood stream by the beta rays they emit. Quantities as small as a millionth of an ounce can be picked up by delicate instruments.

Besides adrenalin, the other radioactive chemical is alloxan-2-C-14, which can be used to induce artificial diabetes in animals.

Science News Letter, February 7, 1953

IN SCIENCE

METEOROLOGY

Better Thunderstorm Forecasting for Midwest

► **BETTER ACCURACY** in forecasting Midwestern thunderstorms, which have taken more than 100 lives in aircraft accidents alone in the past few years, is promised in a report from Chicago to the Weather Bureau in Washington.

The skill score for predicting particular thunderstorms for Chicago, Lynn L. Means of the Chicago Weather Bureau reported, has gone up 8% from 44% to 52%. Thunderstorms are particularly difficult weather phenomena to predict, it is pointed out.

However, results of a study in Chicago, together with other research going on in other parts of the country and future studies of how atmospheric conditions high in the air are associated with thunderstorms, will bring improvement in thunderstorm predicting methods, it is said.

Chicago weathermen discovered that, contrary to previous belief, a surprising number of thunderstorms occurred out in advance of a moving cold front. In one summer in Chicago, not a single thunderstorm was classified as having occurred directly with passage of a cold front.

The system used in Chicago is based on observation that thunderstorms are associated with other kinds of weather phenomena. How often these other things occur before a thunderstorm breaks and to what extent they occur has been figured. This permits weathermen to make their thunderstorm predictions with a greater or less assurance of accuracy.

The main tools in the forecasting technique are charts of flow, temperature and moisture patterns.

Science News Letter, February 7, 1953

TECHNOLOGY

British Ship Jet Engines In Zippered Plastic Bags

► **SHINY NEW** British-made jet engines now are being dressed in sprayed-on plastic bags complete with zippers before being shipped abroad.

An improvement of the English Cocooning technique, the new method lets engines be "packaged" economically. A zipper is laid over the engine, and quick-drying plastic is sprayed on. The plastic forms a tough but pliable airtight coating over the engine's irregular parts and over the zipper. If the plastic web is broken, it can be patched by brushing on fresh liquid.

The bag unzips when the engine is needed and the zipper can be reused.

Science News Letter, February 7, 1953

SCIENCE FIELDS

BACTERIOLOGY

Disease Virus Alive After 35 Years

► A DEADLY disease virus, lost 35 years ago, has been rediscovered still alive in its test tube in bacteriology laboratories at the University of Michigan.

One ten-billionth of a drop containing the virus will kill a rat within a few hours. What it will do to humans is not yet known.

The fact that this virus survived so many years without animal tissues to help sustain it makes it probably one of the most potent of all known viruses in the opinion of scientists at the university.

The virus was first discovered in 1909 by Dr. Frederick G. Novy, former professor of bacteriology and dean of the university medical school and now retired as dean and professor emeritus.

Dr. Novy discovered the virus then during investigations of spirochetes, thought at one time to enter the blood stream and then change into another kind of microorganism.

The virus, rediscovered in a test tube during a clean-up of a laboratory formerly used by one of Dr. Novy's assistants, has been named the "Novy Rat Virus" in honor of Dr. Novy.

Science News Letter, February 7, 1953

SURGERY

Frostbite Footless Can Walk Well Again

► KOREAN WOUNDED who lost a foot, some of them because of frostbite, are being helped by a new operation developed by Drs. August W. Spittler, John J. Brennan and John W. Payne of Walter Reed Army Hospital, Washington.

All of the patients, 36 so far, have "developed an excellent walking gait with stumps capable of bearing the entire body weight without pain," Dr. Spittler said in reporting the new technique at the meeting of the American Academy of Orthopaedic Surgeons in Chicago.

The operation is a modification of the Syme operation, named for Sir James Syme of Edinburgh who developed it in 1843. The Syme operation for foot amputations leaves a heel pad on the end of the ankle, giving the patient a stump on which he can walk around the house without crutches or an artificial leg. But this operation could not be performed in cases where there were draining wounds or infection.

The Walter Reed surgeons modified the technique so that in two operations they were able to save the entire leg bone and

a heel pad. Four weeks after the second operation the patients were able to be fitted with a light plastic boot. This leaves the knee action free and patients can walk about their homes without it. And this operation can be performed even when infection is present. There was active infection in all 36 patients at the time of the first stage operation, with gangrene in 12.

Thirty of the patients now wear their plastic boot a full day, performing their routine duties. Sixteen are doing manual labor and four have returned to military duty.

Science News Letter, February 7, 1953

BIOLOGY

Find Salamander Has High Cancer Resistance

► THE ANCIENTS believed that a salamander could not be destroyed by fire, but Dr. A. M. Schechtman, professor of zoology at the University of California at Los Angeles, is interested in the lizard-like animal because it has an unusually high resistance to cancer.

He has found that some cancer-causing chemicals that invariably produce cancers in other animals do not produce the disease in the salamander.

Such chemicals, however, do stimulate growth in the salamander's skin but do not form a malignant tumor as they do in other animals. This growth may develop into a lump, but apparently it is sealed off so that the growth does not spread far in the body nor interfere with vital organs.

Just what factors are involved in the salamander's strong resistance to cancer is not known. Dr. Schechtman suspects that there might be some relationship to the animal's remarkable regenerative powers. A salamander can lose a leg or tail and grow a new one within a few months.

Science News Letter, February 7, 1953

ENGINEERING

Liquid Runs in Generator Like Blood Through Veins

► A NEW electric generator being designed in Schenectady, N. Y., will have a cooling liquid surging through its hollow copper wires much like blood flows through a man's veins.

General Electric Company engineers said the generator is the first large machine of its kind in the history of the electrical industry.

The cooling system will go into the stator, the stationary part of the generator. Heat from the rotor will be carried off by more conventional hydrogen-gas methods.

To be driven by a tandem-compound turbine, the machine is for installation in 1955 at the new Eastlake power plant of the Cleveland Electric Illuminating Company. It will generate 208,000 kilowatts of electricity, or more than 200,000 horsepower.

Science News Letter, February 7, 1953

AERONAUTICS

Plan Mobile Hangar For Fast Get-Away

► AN AIRPLANE hangar that can drive around the Marine Corps' airfield, Cherry Point, N. C., at 35 miles an hour is in the planning stage. When completed, the hangar will supersede the model now in service that merely pulls apart at the flip of a switch.

The mobile hangar will be designed in two sections. Each section will be mounted on rubber tires and will be powered by a giant diesel traction unit.

The object of the radical hangar is to speed "garaged" fighter planes into the sky. When an emergency arises, the hangar pulls apart, leaving the "garaged" planes free to take off. At present, planes have to be carefully worked out of their hangars by ground crewmen. In this age of supersonic planes and guided missiles, that process simply takes too much time, the Navy figures.

A similar hangar already is being used at the airfield, *Steelways* (Feb.) reports. At a flip of a switch, the two triangular-shaped hangar sections pull apart, rolling along tracks. Within 60 seconds all the planes are exposed. Each section weighs 55 tons and is powered along the tracks by a self-contained diesel-electric engine. Airplane maintenance workshops are situated in the ends of the hangar section.

Science News Letter, February 7, 1953

MEDICINE

Old Indian Remedy Is Tried on Fungus

► A RENEWED interest is now being shown in an old Indian remedy used to treat many types of ailments, ranging from influenza to battle wounds.

The remedy is leptenin, a substance made from desert parsley, or "bitter-root" as the Indians called it.

Daniel Johnson of the University of California at Los Angeles School of Medicine has found that leptenin has shown promise in controlling one of the disease-causing fungi in preliminary laboratory studies. It seem to control coccidioides (valley fever) fungus more effectively than current antibiotics in the test tube investigation.

The Indians used a brew of the desert herb to ward off various diseases, and made an ointment from the plant to treat wounds. It was noted that Indians using it seemed to remain remarkably free of infection. Just how much the remedy contributed to this is not known.

Present studies of extracts from the plants are only in the test tube stage, Mr. Johnson emphasizes. Many animal studies will have to be performed to evaluate the substances as therapeutic agents.

Mr. Johnson's research is supported by the Volker Charities Foundation.

Science News Letter, February 7, 1953

ENGINEERING

Factory Robots Rival Men

Machines that correct their own mistakes gradually are taking over American industry. They turn out products more quickly than men and they need little supervision.

By ALLEN LONG

► **CONTROL ENGINEERS** are whipping up bigger and better robot machines to take the place of factory workers.

The machines are largely automatic. Some even correct their own mistakes. They can control chemical processes better than men can control them. They work faster, produce more and need less supervision than their human counterparts.

But that does not mean, necessarily, that workmen are facing a two-headed dragon eager to devour their jobs. Instead, it may mean that Labor is at the doorway of a brighter and happier future.

Economists predict the future factory workman will be more highly skilled than he is now. He will draw more pay, have more leisure and will be happier in his job. Lots of routine work will be handled by machines that do not feel drudgery.

Labor probably will not be thrown out suddenly on its ear as automatic machines invade the factory. The machines will take over gradually, probably so slowly as to escape notice.

Require Skilled Workmen

Even if existing factories are converted to automatic plants, the apparent switch from men to machines may not be as serious as it first appears.

H. L. Waddell, editor of *Factory Management and Maintenance*, recently told the American Society of Mechanical Engineers:

"I know of a chemical plant that had about 1,000 employees five years ago. The management decided upon complete modernization plus a 50% expansion in capacity. Today the plant has almost the exact number of employees. But instead of 700 production workers and 300 maintenance men, there are now about 550 production workers and 450 maintenance men."

That seems to bear out the opinion of the experts who foresee a more highly skilled workman in the factories of tomorrow. It will take such very skilled craftsmen to keep the automatic machines running properly.

Most petroleum refining processes already are instrument-controlled. The instruments keep wary switches ready to close the moment something goes wrong. When an error is detected in the refining process, the instruments insert the proper corrections so that the end product will be up to snuff.

Refineries have come to lean heavily on the mechanical watchmen. If the instru-

ments were removed and their jobs were given to men, America would be hit hard right in the gas tank. This is about what would happen:

The now-efficient refining processes would give way to less efficient ones. That in turn would raise further the growing demand for crude oil.

Gasoline quality would plummet. Busting city streets would become the scene of sputtering autos backfiring their way through traffic. Even automobile engines might have to be redesigned to work on the lower-quality fuel.

To robot controls belongs much of the credit for today's high-quality motor fuel, experts say. If the instruments were removed, many refineries simply would have to shut down.

Automatic machines can be simple or complex. But they all have one thing in common. They work on what is called feedback, which is merely a process of comparing the actual product with the desired product and of making corrections. A thermostat in the living room of a house

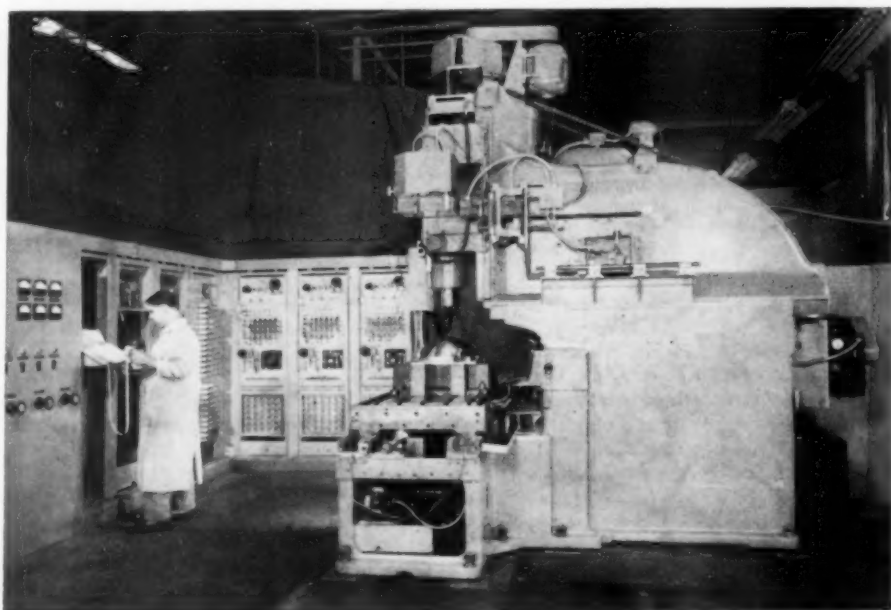
compares the actual temperature there with the desired temperature for which the thermostat has been set. When the house begins to overheat, the thermostat cuts off the stoker. When the house begins to get too cool, the thermostat starts up the stoker.

One of the earliest forms of feedback was exemplified by flyball governors. As the load on a steam engine increased and its speed fell off, the whirling flyballs dropped down a bit. Linked to the steam valve, the dropping flyballs opened the valve a little more. That let the engine carry the bigger load at the proper speed.

Feedback System in Radio

From the flyball governor, feedback control has spread to all sorts of devices. Most ordinary radios, for instance, have a feedback system that radio engineers call the automatic volume control. The AVC circuit makes the radio's vacuum tubes more or less sensitive as the signal strength changes from the station to which the radio is tuned. How much volume control jiggling the AVC saves the listener cannot be appreciated unless he can switch it off for a startling comparison.

In the category of the more-complicated machines is the device invented by Prof. W. M. Pease of the Massachusetts Institute



GIANT FACTORY ROBOT—The entire system of the electronically controlled milling machine at Massachusetts Institute of Technology is shown in this picture. The machine tool at right works from information sent to it by the control panels at the left. The controls use about 270 vacuum tubes, 170 telephone-type relays and 300 germanium diodes.

of Technology Servomechanisms Laboratory. The machine can take a strip of punched tape and automatically mill a complete machine part. If the product begins to vary from the product "described" by holes in the tape, the machine makes corrections.

The advantage of many of the complex automatic machines lies in their versatility. They can be switched from the production of one part to another merely by changing the tape that instructs them.

Although American industry still is far from being "automatized," it nevertheless seems headed in that direction. Machines now are being thought about, talked about and experimented with that even may be

able to do paper work which up to now could be done only by humans. Such machines may come in handy in payroll and accounting departments of medium-sized and large companies.

Other machines have been devised to predict the weather, to control the flow of a big city's traffic, to count paper money, to sort lemons according to color, to solve test mazes set up for them in the laboratory, and to play ticktacktoe.

One British-built electronic device, affectionately known as the Madam II, can even sing "God Save the Queen," when given a coded version of the score. No record or phonograph is in the machine.

Science News Letter, February 7, 1953

METEOROLOGY

Sun Affects Weather

► TERRIFIC BURSTS of energy from the sun in the form of solar flares must have an effect on earth's weather, but nobody knows just what that effect is.

This was the consensus of the opinions of meteorologists, astronomers and other scientists who spent a full day discussing solar-weather relationships at the meeting of the American Meteorological Society in New York.

Dr. Donald H. Menzel, Harvard College Observatory astrophysicist, pointed out that the quality and quantity of solar radiation vary appreciably through the sunspot cycle, and that the energy sent out during these fluctuations certainly reaches the upper layers of the earth's atmosphere.

A pronounced effect is observed on the earth's magnetic field which can be seen in the aurora borealis, he said. However, so far as direct effects on the weather at the earth's surface are concerned, Dr. Menzel said that it is too early for these effects to be determined. He called for more studies of the relationships between solar activity and the weather.

Dr. Bernard Haurwitz, head of the meteorology department at New York University and a long-time student of solar weather relationships, was pessimistic about the ability now to establish such a direct

relationship. A theory he propounded six years ago that the energy resulting from solar flares may heat the ozone high in our atmosphere which in turn heats the air we breathe is, he said, probably no longer valid.

Two recent cases of remarkable increases in temperature immediately following solar flares make his theory no longer good precisely because the increases were so large. Solar flares could not by themselves have brought about these changes in the earth's temperature, he said.

Dr. Haurwitz emphasized that, so far, there are few, if any, acceptable observations which show direct relationships between solar activity and the weather.

However, Dr. Joseph Kaplan and Hilda Kallman of the University of California at Los Angeles described what they said was a new mechanism by which increases in ultraviolet radiations from the sun are felt low in the earth's atmosphere. In this process, they said, the ultraviolet is transformed into absorbable infrared.

Science News Letter, February 7, 1953

GENETICS

Resistance to Leukemia In Mother Mouse's Milk

► LEUKEMIA, CANCER of the blood, is influenced, in mice at least, by a maternal resistance factor, or MRF.

This was reported by Dr. L. W. Law of the National Cancer Institute, Bethesda, Md., to the New York Academy of Sciences conference on parental age and characteristics of the offspring.

The leukemia-resistance factor is contributed both before birth and through the mothers' milk by the mother mouse low in tendency to get leukemia, Dr. Law said. However, no factor that tends to bring on leukemia, similar to the factor in the milk of mother mammals that is tumor-inducing, has been found in the low-leukemia mice.

Science News Letter, February 7, 1953

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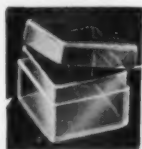
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• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

BASIC ELECTRONIC TEST INSTRUMENTS: Their Operation and Use—Rufus P. Turner—*Rinehart*, 254 p., illus., \$4.00. To acquaint the electronics technician with the instruments of his art. The book includes directions for building those which are not available ready-made.

EDUCATION IN TURKEY—Abul H. K. Sassani—*Govt. Printing Office*, Office of Education Bulletin 1952 No. 10, 96 p., illus., paper, 30 cents. General education became possible in Turkey with the introduction in 1928 of Latin characters to replace the Arabic script which was so difficult to learn to use accurately. Now education vies with defense for first place in the national budget.

HEADACHES: Their Nature and Treatment—Stewart Wolf and Harold G. Wolff—*Little, Brown*, 177 p., \$2.50. This non-technical book will interest all those who suffer from headaches (and who does not?). Although 90% of headaches are due to vascular causes or to muscle tightness, some, including some sinus aches, can be traced to emotional difficulties.

JOURNAL OF CLINICAL AND EXPERIMENTAL HYPNOSIS: Volume 1, Number 1—Milton V. Kline, Ed.—*Woodrow Press*, 82 p., paper, \$6.00 a year, single issues \$2.00. This new journal is a direct outgrowth of the development and activity of the Society for Clinical and Experimental Hypnosis, and provides a medium for publication of scientific papers on hypnosis.

MESON PHYSICS—Robert E. Marshak—*McGraw-Hill*, 378 p., illus., \$7.50. For advanced

students and research workers in meson physics. Knowledge of quantum mechanics and quantum theory are presupposed.

OUT OF STEP: A Study of Young Delinquent Soldiers in Wartime; Their Offenses, Their Background and Their Treatment Under an Army Experiment—Joseph Trenaman—*Philosophical Library*, 223 p., illus., \$4.75. During the war, the British army formed Special Training Units for disciplinary problem soldiers. A few of the men were found to be physically or mentally handicapped. With others chief cause of trouble was parental neglect.

PATHOLOGY IN SURGERY—Edwin F. Hirsch—*Williams & Wilkins*, 474 p., illus., \$10.00. This text gives surgical pathologists and students the benefit of the author's rich experience at St. Luke's Hospital, Chicago. Bountifully illustrated.

WATER: Miracle of Nature—Thomson King—*Macmillan*, 238 p., \$3.50. An entertaining book about water in all its forms and states, describing its many uses and conservation.

YOUR HEALTH, SIR!—Miriam Lincoln—*Harper*, 211 p., \$2.75. Devoted specifically to the health problems of American business and professional men, this book is based on a series of articles written for "Esquire." The author is a practicing physician.

Science News Letter, February 7, 1953

GENERAL SCIENCE

Name Honorable Mentions

► **HONORABLE MENTIONS** in the Twelfth Annual Science Talent Search were announced on Feb. 5. Girls number 57 of the 260 outstanding seniors in the list, and 203 are boys. This division was determined by the ratio of girls to boys who participated in the competition.

The 260 young people to whom Honorable Mention listing was given reside in 148 communities, located in 38 states. They were chosen from among 14,260 entrants, 2,264 of whom completed the science aptitude examination, submitted recommendations and scholarship records, and wrote reports on "My Scientific Project."

The 40 highest ranking boys and girls, winners of all-expense trips to Washington, were listed in last week's *SCIENCE NEWS LETTER*. (See p. 70.)

In the 11 preceding Science Talent Searches, most of the students named in the Honorable Mentions list have been offered scholarships, and many of those named this year will qualify for valuable scholarships and other financial aid in the colleges, universities and technical schools of their choice. The judges found all 300 boys and girls to be students of outstanding ability.

Students in the Honorable Mentions list invariably rank high in their high school

SURGERY

Nylon Makes Arthritic Knees Work Prettily

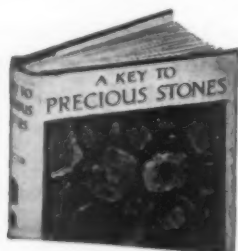
► **MORE THAN 50** once painful, stiff arthritic knees are now moving easily, thanks to nylon. The nylon, in very thin sheets, is used to line the under surface of the knee cap.

The technique for stapling the nylon's sheet, or membrane, to the bone by small stainless steel staples was developed by Drs. John G. Kuhns, Theodore A. Potter, Robert S. Hormell and William A. Elliston of Boston. They described it at the meeting of the American Academy of Orthopaedic Surgeons in Chicago.

They reported "satisfactory functioning" resulted in 58 of 78 arthritic knees operated on. Although performed on only one knee, the operation makes it possible for the patient to get around without help. The nylon knee liners were only given to joints which had not responded to other treatment.

Motion is started when the skin wound is healed after the operation. Partial weight bearing, with the knee in a plaster cast, is allowed after three weeks. But it takes about six months to get good function in the joint and adequate strength in the thigh muscles. After healing of the wound, there is usually no swelling, tenderness or local heat. The knee feels the same as the other side in motion.

Science News Letter, February 7, 1953



A Key to Precious Stones

By L. J. SPENCER

Formerly Keeper of Minerals, British Museum

"The author has set a high standard for popular works on scientific subjects. By avoiding technical treatment and using simple language he introduces the reader to the fundamentals of the subject. Well-worn facts are given new lustre and recent discoveries are presented in a manner that is intelligible to the layman. Within the compass of a small, inexpensive book, provided with a good index, is collected considerable information formerly scattered through a voluminous literature, including much that is new to the advanced student."—*Mineralogical Magazine*.

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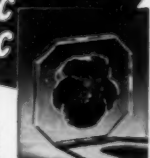
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What GENERAL ELECTRIC People Are Saying

G. E. HENRY

General Engineering Laboratory

CLEANING WITH SOUND: It is now some twenty-five years since Wood and Loomis first demonstrated the remarkable physical and chemical effects of high frequency, high power, sound in liquids. People have been busy, during this time, looking for ways to turn these effects to practical advantage, especially in the chemical industry. During the last three or four years, however, the most notable advances have been made not for the chemical producer, but for the metal-working industries—specifically for those engaged in small-parts fabrication. High power ultrasonics offers the best means yet devised for cleaning these small parts.

An instrument ball bearing, a small pump fitting, or some other precision made work piece is immersed in a solvent; a high frequency sound wave beamed through the solvent strikes the metal surface and removes almost instantly any film of oil or grease, together with dirt, chips, or other foreign matter.

There is no longer any question of the superiority of ultrasonic cleaning when the characteristics of the work piece and the economics of production are favorable for the application of the new method. The great question remaining is how far the method can be extended to include different kinds of parts—how large a proportion of the total metal cleaning business can be profitably handled with ultrasonics.

*IRE, Evansville—Owensboro Chapter
Owensboro, Ky.*



W. R. G. BAKER

Electronics Division

ELECTRONICS TOMORROW: Human qualities being what they are, man has always had a great interest in the future.

What electronics will do for us tomorrow, or next year, or 50 years from now depends only partially on the state of the art, or the advancement of our knowledge about electronics. It depends upon what

we know about electronics, certainly, but it also depends greatly upon our economic circumstances and our political atmosphere.

Broadly, this is the promise that electronics holds for us. It offers us a means to increase productivity and therefore our standard of living. It offers us quicker and better methods of communications in all areas of industry, commerce, education and entertainment. It offers us a way of making better use of our skills. It offers us a way of bolstering our defenses against aggression.

These promises will not turn into reality automatically and without effort on our part.

They call for investment on our part not only of capital funds but of human resources. We must make it possible for greater numbers of young men and women to receive the education and training that will permit them to participate in this more highly technical civilization and to contribute to its continued growth. We must continue to invest in research, to broaden the basic knowledge on which we can build a stronger economy.

There is one other area in which engineers can make a contribution to the advancement of this country's strength and its future. Science cannot guard against the intellectual germ warfare being carried on by the proponents of the "something-for-nothing-isms." Engineers cannot design electronic devices or atomic weapons to protect against this type of infiltration. But engineers can make certain that their economic and political education advances in step with their technical education. The ability to separate truth from propaganda is as important as the ability to separate scientific fact from misinformation. Your future may depend on your ability to do both.

*Institute of Radio Engineers
Washington, D. C.*

J. J. FITZGERALD

Knolls Atomic Power Laboratory

SAFETY IN NUCLEAR OPERATIONS: Waste gases as finally discharged into the air, from the Knolls Atomic Power Laboratory at Schenectady, N. Y., are no more radioactive than the normal surrounding atmosphere and in many instances are even less radioactive.

These gases are discharged through a 100-foot stack, and are constantly monitored to make sure that the concentration of radioactive material is kept well below permissible limits.

Constant air monitors are located at selected sites to check the radioactive concentrations at various points near ground level. Plant samples also are analyzed on a regular schedule to evaluate the accumulation of radioactivity on vegetation.

Waste radioactive gases and smokes from the working areas are first passed through a "scrubber," in which a caustic solution washes out the larger radioactive particles as well as the more volatile components. Next they go through a high-efficiency filtering system, which removes more than 99.9 per cent of the small amount of radioactive material left. The air that remains is diluted, from a thousand to ten thousand times, with filtered air from the ventilating system of the building, and then is discharged through the stack.

Normal atmosphere contains measurable but harmless quantities of radioactive elements, and these produce radioactive particles which are also removed by the filtering process.

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Questions

AERONAUTICS—What is the advantage of a mobile hangar? p. 89.

BACTERIOLOGY—How old is the Navy Rat Virus? p. 89.

ELECTRONICS—What devices are foreseen resulting from commercial production of transistors? p. 86.

METEOROLOGY—How many lives have been lost in aircraft from Midwest thunderstorms in the past few years? p. 88.

MEDICINE—What is recommended as the "only logical method" of reducing weight? p. 87.

PHYSICS—How is evidence of an atomic explosion gathered? p. 85.

SURGERY—What new chemical aids recovery of sprained ankles? p. 84.

Photographs: Cover and p. 85, Atomic Energy Commission; p. 83, General Electric Company; p. 86, American Museum of Natural History; p. 87, University of Notre Dame; p. 90, Massachusetts Institute of Technology; p. 96, Tacony File & Hardware Co.

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MEDICINE

Rashless German Measles

► YOU CAN have German measles without the telltale rash.

This has been long suspected. The first scientific proof of it is reported by Drs. Saul Krugman, Robert Ward, Kathryn Giblin Jacobs and Martin Lazar of New York in the *Journal of the American Medical Association* (Jan. 24).

The proof is significant because cataracts, deafness, feeble-mindedness, congenital heart disease, abortions and stillbirths have been reported to afflict infants whose mothers had German measles during the first three months of pregnancy.

Since German measles is a very mild disease, it could go unnoticed if no rash appeared. Perhaps, the New York doctors suggest, these cases without the rash may have been responsible for many more pre-birth damaged babies than anyone can guess at.

Little girls could be immunized against

German measles long before they were old enough to become mothers. Then there would be no danger to their future unborn babies. Blood and nose and throat washings of German measles patients contain the virus of the disease during the first day of the rash and in some cases two days before the rash, the New York doctors found.

Injectations of these materials in children under four years who had never had German measles produced typical cases in nine to 16 days. This "experimental" German measles is contagious. Two grown-ups caught the disease from two of the children who got it by the inoculation method.

Because of this contagiousness, it might be dangerous to immunize little girls in this way. It might start an epidemic in the community and pregnant women might get the disease when otherwise they might escape it.

Science News Letter, February 7, 1953

METEOROLOGY

Theory on Jupiter's Spots

► A CREATURE on Jupiter with a powerful telescope would probably see the same kind of spots traveling over the face of the earth that we can see traveling across the face of Jupiter.

They are probably caused by the same thing, Dr. Yale Mintz, assistant professor of meteorology at the University of California at Los Angeles, told a meeting of the American Meteorological Society in New York. That creature on Jupiter would see large bright spots about one-sixtieth to one-twelfth the size of the earth traveling across the face of the earth on the north side of the equator.

There might be as many as six or seven in a row, Dr. Mintz said. These are the result of very high level storms in our tropics, he said, a phenomenon meteorologists have known about only in recent years. They are mostly above 30,000 feet and seem to have little direct effect on the weather at ground level right below them.

Similarly, dark spots travel across the face of Jupiter. Dr. Mintz said that C. E. Palmer of U.C.L.A. had found some relationship between the earth's spots, or high level clouds, and the bursts of activity on the sun. A few days after the sun has put out more ultraviolet radiation, Dr. Palmer thinks, more high level storms appear in our tropics. Dr. Mintz checked the records and found that there seemed to be peaks of dark spot activity on Jupiter a few days after peaks of ultraviolet radiation on the sun.

Mars has an atmosphere similar to ours in that the higher you might get in the air of Mars, the colder you would be. This is

the finding of Dr. Jean I. F. King of the Cambridge, Mass., Air Research Center. Studies of Mars, he said, showed that the temperature on the surface is about 240 degrees on the absolute scale. This is about 28 degrees below zero Fahrenheit.

The atmosphere on Mars, Dr. King reported, appears to be stable up to about four and a half times. At that height the temperature is believed to be about 200 degrees absolute, or about 100 below zero Fahrenheit.

Because the Martian atmosphere is believed to be lacking in both water and oxygen, measuring it is simpler than measuring the earth's atmosphere, since scientists do not know exactly how much radiation of what wavelengths is absorbed by the earth's outer envelope.

Science News Letter, February 7, 1953

Each farm rat eats about \$5 worth of food a year.

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PHYSICS

Thermometer Uses Noise In Taking Temperatures

► SCIENTISTS AT the National Bureau of Standards in Washington are investigating a noise-sensitive thermometer with an eye toward setting it up eventually as a standard for measuring high temperatures.

E. W. Hogue of the NBS heat and power division told the Instrument Society of America meeting in Washington that no satisfactory thermometer has been developed yet which can measure temperatures in the order of 2,000 degrees with high accuracy.

A thermal thermometer, which uses the electrical noise generated by heat in a fine platinum wire, seems to offer promise. However, the desired degree of accuracy has not been obtained as yet.

First built at the University of Chicago in 1948, the thermometer compares the noise in two conductors, one of which is held at a known temperature.

The noise is generated by movements of electrons in the two wires. Agitated by heat, the moving electrons create several millionths of a volt which is amplified to a measurable quantity. A comparison of the two different noise levels and voltages can be made to yield the temperature of the object under study.

Science News Letter, February 7, 1953

Do You Know?

Some kinds of fish catch *birds* that flutter too close to the water.

A new *filter*, although all metal, can separate water from gasoline.

Cracked or chipped *china* or pottery cannot be kept sanitary by ordinary dish washing methods.

About 50% of all two- and three-year-old children in Michigan have some degree of *dental decay*, a study shows.

Through research, a maple *syrup* has been developed with a flavor intensity four to six times greater than that of syrups produced by usual methods.



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❁ **LINE-GRIPPER** *ALLOWS* housewives, boat owners, tennis players and others to tie things up without knotting the tie-line. A plastic clothes line, for instance, is pulled tightly through two circular plates of the small device, and is clamped there with a hand-operated screw. Eight teeth grip the line securely in vise-like fashion. Will hold most plastic lines, ropes and cables.

Science News Letter, February 7, 1953

❁ **BOTTLE CAP-SPOUT** for milk bottles delivers an even, gurgle-free stream of milk to the glass. Made of a non-breakable polyethylene plastic, the spout is sized to fit standard milk bottles, but has a special ring to adapt it to odd-sized bottles. When not in use, the spout is covered with a protective cap.

Science News Letter, February 7, 1953

❁ **VACUUM SWITCH** shuts off the power when the liquid supply being pumped runs dry. Designed for use with electric motors and gasoline engines, the switch also can serve as a warning where operating conditions depend upon a vacuum. Attached to the vacuum line, the switch operates when the "suction" drops below a given amount.

Science News Letter, February 7, 1953

❁ **PRECISION FILE** set, micrometer-checked to thickness tolerances as low as four ten-thousandths of an inch, features 18 small files varying in thicknesses from .072



to .009 inch, as shown in the photograph. Especially useful in hard-to-reach places, the files can serve as go-or-no-go gauges during maintenance of delicate, high-speed machinery.

Science News Letter, February 7, 1953

❁ **EMERGENCY LIGHT** unit plugs into standard alternating current outlets and comes on automatically the instant the regular power fails. Operating from a built-in

storage battery kept in good condition by a trickle charger, the portable unit throws light for 10 hours from two sealed-beam lights during the emergency. Suitable for hospitals, theaters and industrial plants.

Science News Letter, February 7, 1953

❁ **ADJUSTABLE REFLECTORS** for fluorescent lights can be moved with the flick of a finger to five different positions to direct light where it is needed. Made of enamel-trimmed 20-gauge steel, the fixtures can be obtained to take 20-watt or 40-watt fluorescent lamps.

Science News Letter, February 7, 1953

❁ **NOTE-ENVELOPE PAPER**, double post-card size, provides enough writing space for thank-you notes to friends, plus a paragraph or so of family news. The card-like sheet can be folded in the center into a neat envelope which can be addressed, stamped and mailed. The top half tucks into a slot in the lower half, eliminating flap-licking.

Science News Letter, February 7, 1953

❁ **FIRE-RESISTANT PAINTS** react with flames to form a non-toxic gas which blankets the painted surface, choking off oxygen that feeds the fire and reducing the size of the blaze. Available for interior or exterior use, the paints are durable, washable, and easy to apply.

Science News Letter, February 7, 1953

• Nature Ramblings •

➤ **UNTIL RECENTLY**, earthbound man could only dream of flight, longingly watch the birds—and stay right there on the ground. Yet for ages many plants, though blind, unconscious, unknowing, have borrowed birds' wings for their seeds.

Evidences of these borrowed flights are so common all about us that as a rule we pay no attention to them—the survivors of such voyages sprout in every fallow field, stand thick in every fence-row.

Birds that eat seeds as food, in particular weed seed, are seldom active agents in disseminating those particular species, it is believed. The seeds are ground up in their gizzards, digested, and that is the end of them.

Jays, woodpeckers and other birds that carry off acorns and other large seeds, however, often unwittingly plant them. They may drop them in flight, or after they have

Bird-Borne Seeds



hidden them they may either forget about them or die and leave them unused, to sprout in the spring.

Intermediate between these two classes one might notice a group of birds that often dig conifer seeds out of their cones. Included here would be crossbeaks, siskin,

grosbeaks and several other members of the finch family.

The seeds they swallow do not survive; but in their diggings and prying they often drop some seeds, which then swirl down the wind on their own wings. The birds here are not carriers, but launchers only.

Birds that eat seeds covered with more or less palatable pulp are perhaps the most effective agents of distribution. Here the pulp alone, as a rule, serves as food; the seed passes through the digestive tract unharmed and is dropped under the bird's perching-place.

That is why fence-rows, stone walls and similar places are apt to be marked by rows of red cedar trees, and to be covered with growths of such berry-fruited scramblers and vines as Virginia creeper, wild grape, poison ivy, moonseed, false bittersweet and dewberries.

Science News Letter, February 7, 1953